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User Manuel

SimuKRC
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1   Introduction

SimuKRC is an application that shows a virtual robot (KR6) that is piloted by the OfficeLite Software from Kuka. We wrote this program because it is more fun to see a robot moving when you test OfficeLite, which simulates the standard user interface of Kuka robots.

The actual version of OfficeLIte is 5.5 which needs a licence. To try OfficeLite, you can download a demo version (4.1.7) at http://www.kuka-robotics.com/germany/de/downloads/. This version is useable for 30 days only, it does not work on all recent computers (multi core processors are not well supported).

2   Installation

2.1   Kuka OfficeLite

We tested the versions 4.1.7 and 5.5 on Windows 2000 and Windows XP. For us, they worked well, even on a virtual machine (VirtualBox from Sun/Oracle). For 5.5 you need a valid licence file that corresponds to the MAC address of your network card.

2.2   PosServer

This is the position server. It is based on OLE of Microsoft. It reads the position of the robot axis and sends them out with the UDP/IP protocol.

We have realized 3 different versions:

- PosServer1 users the interface "Crosscommexe.exe" which was still provided in 4.1.7

- PosServer 2 uses "Cross.ocx", it is compiled for OL 4.1.7.

- PosServer 3 uses "Cross.ocx", it is compiled for OL 5.5 (the interface cross.ocx had slightly changed).

"Cross.ocx" has the advantage being more complete, but it is less documented.

OfficeLite should start automatically the position server "PosServer.exe". To do so, you have to add the key

[HKLM\Software\Kuka Roboter GmbH\Manager\Boot\PostInit\1].

"1" is here the first available number. Then create a string value "Exe" which points to our application (for exemple "c:\SimuKr6\PosServer3\bin\PosServer.exe").

Remark: your firewall should let pass the datagrams. We use the port 4849.

2.3 Visualization software

To visualize the virtual arm, we use the InstantPlayer from Fraunhofer Institute for Computer Graphics, Darmstadt. You can download this software at http://www.instantreality.org/downloads/. It is free for not commercial use. This program work very well on Windows XP, Vista and Windows 7[1]. Windows 2000 is not supported.

2.4 kr6.class: the server of the arm

This server reads the datagrams from our PosServer software, and commands the virtual scene by using the External Authoring Interface from VRML (Virtual Reality Modeling Language).

This program was written in java (kr6.java). We use the virtual runtime environment jre6 that is certainly already installed on your computer, else you can download at http://www.java.com/fr/download/manual.jsp.

To get the server to work, we wrote a "bat" file for windows. It is called kr6.bat and you find it in the "visu" directory.

You have to modify the first lines in this file!

set PLAYERDIR=C:\Program Files\Instant Player
set JAVADIR=C:\Program Files\Java\jre6
set SIMUKR6DIR=D:\SimuKr6

PLAYERDIR is the directory, which you have chosen for the InstantPlayer, JAVADIR the directory of the virtual java machine and SIMUKR6DIR the root directory of our application.

On the visualization computer (it can be the same as the machine for OfficeLite), the ports 4848 and 4849 must be open.

Now you can finally start the visualization by executing the kr6.bat file.

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[1] We had to update the VGA Driver on our computer to enable hardware acceleration.

3   Conclusion

You can use our software by respecting the copyright remarks from Kuka, Sun, Oracle, Frauenhofer ICG, … You can copy it for your personnel and non-commercial use.

We provide the source code (using the C++Builder version 5 and the Java SDK). Thus you can modify everything, even the virtual world (ASCII wrl files)

Thank you to Martin Rohrmeier for publishing his Diplomarbeit, to Paul Chavant for his great work concerning the crosscomm interface, to Frauenhofer for the InstantPlayer, http://www.roboterforum.de/ for the good advices and finally to Kuka for OfficeLite.

We are interested in your remarks and hope that you have fun with our little realization.

Tilman Jochems

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                Midi-Formatique Jochems
                Formation & Informatique
                Analyse d'Images, Automatisation

   Espace Entreprises Méditerranée        Tél  +33  (0)468370443
   66600 Rivesaltes                             +33  (0)468648585
                                          Mail mfjnet@dbmail.com
                                          WWW  mfj.chez-alice.fr
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